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# Characterization of normal traces on von Neumann algebras by inequalities for the modulus

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## Abstract

It is proved that if a normal semifinite weight ψ on a von Neumann algebra M satisfies the inequality ψ(|a 1 + a 2|) ≤ ψ(|a 1|) + ψ(|a 2|) for any selfadjoint operators a l, a 2 in M, then this weight is a trace. Several similar characterizations of traces among the normal semifinite weights are proved. In particular, Gardner's result on the characterization of traces by the inequality |ψ(a)| ≤ ψ(|a|) is refined and reinforced.

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## Keywords

Normal semifinite weight trace, Ultrastrong topology, Ultraweak topology, Von Neumann algebra